

Amendment and Response

Applicant: Joseph M. Torgerson et al.

Serial No.: 10/827,030

Filed: April 19, 2004

Docket No.: 200210152-1

Title: FLUID EJECTION DEVICE

REMARKS

The following Remarks are made in response to the Non-Final Office Action mailed October 19, 2007, in which claims 3, 5, 32, 34-42, and 45-50 were withdrawn from consideration as being directed to a non-elected invention/species, and claims 1, 4, 6-22, 24-31, 33, 43, 44, 56, and 57 were rejected.

With this Amendment, claims 1, 22, 43, and 56 have been amended to clarify Applicant's invention.

Claims 1, 4, 6-22, 24-31, 33, 43, 44, 56, and 57, therefore, remain pending in the application and are presented for reconsideration and allowance.

Claim Rejections under 35 U.S.C. § 103

Claims 1, 4, 6-19, 21, 22, 24-31, 33, 43, 44, 56 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maze et al. US Publication No. 2001/0008411 in view of Cleland et al. US Patent No. 6,491,377.

Claims 1, 22, 43 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by Meyer US Publication No. 2002/0109755 in view of Cleland et al. US Patent No. 6,491,377.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maze et al. US Publication No. 2001/008411 and Cleland et al. US Patent No. 6,491,377 and further in view of Chen et al. US Publication No. 2002/0135640.

[Regarding the rejection of claims 1, 22, 43, and 45 under 35 U.S.C. 102(b) as being anticipated by Meyer US Publication No. 2002/0109755 in view of Bhaskar et al. US Patent No. 5,808,640, as this rejection is based on a combination of references, Applicant assumes that this rejection is a rejection under 35 U.S.C. 103(a) rather than 35 U.S.C. 102(b).]

With this Amendment, independent claim 1 has been amended to clarify that the fluid ejection device includes "first firing resistors disposed along the first fluid feed slot and first nozzle openings each associated with one of the first firing resistors, wherein the first firing resistors are configured to respond to a first current to heat fluid provided by the first fluid feed slot via a fluid path and eject the fluid from the associated one of the first nozzle openings," and "a reference conductor formed on the substrate and configured to conduct the first current from the first firing resistors, wherein the reference conductor is disposed between adjacent ones of the first firing resistors as

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associated with respective ones of the first nozzle openings and under the fluid path in an area between the first fluid feed slot edge and the first firing resistors."

With this Amendment, independent claim 22 has been amended to clarify that the fluid ejection device includes **"first nozzle openings each communicated with a respective one of the first vaporization chambers," and "a reference conductor formed on the substrate and disposed between adjacent ones of the first vaporization chambers as communicated with respective ones of the first nozzle openings and under the fluid path in an area between the first vaporization chambers and the first fluid feed slot edge."**

With this Amendment, independent claim 43 has been amended to clarify that the method of operating a fluid ejection device includes **"heating the fluid received from the first fluid feed slot in response to receiving the first current at the first firing resistors and ejecting the fluid from respective first nozzle openings each associated with one of the first firing resistors," "receiving the first current from the first firing resistors at a reference conductor formed on the substrate between adjacent ones of the first firing resistors as associated with respective ones of the first nozzle openings and under the fluid path in an area between the first fluid feed slot edge and the first firing resistors," and "conducting part of the first current through the reference conductor as disposed between the adjacent ones of the first firing resistors and between the first fluid feed slot edge and the first firing resistors."**

With this Amendment, independent claim 56 has been amended to clarify that the fluid ejection device includes **"nozzle openings each communicated with a respective one of the vaporization chambers," and "a reference conductor disposed between adjacent ones of the firing resistors as communicated with respective ones of the nozzle openings, between the conductive leads of the adjacent ones of the firing resistors, and under the fluid path in an area between an edge of the fluid feed slot and the vaporization chambers."**

Accordingly, as outlined in the Specification at page 27, lines 9-18, by disposing the reference conductor between the ink feed slot edge and the firing resistor areas, including the firing resistors, and between the firing resistor areas of adjacent firing cells, the present invention is advantageous in that the reference conductor has a larger or increased area. Thus, as outlined in the Specification at, for example, page 27, lines 15-19, the larger area of

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the reference conductor reduces the energy variation between firing cells and provides a more uniform ink pattern.

With respect to the Maze, Cleland, Meyer, and Chen references, Applicant submits that these references, individually or in combination, do not disclose a fluid ejection device as claimed in independent claim 1 including, amongst other things, a reference conductor formed on a substrate and configured to conduct a first current from first firing resistors, wherein the reference conductor is disposed between adjacent ones of the first firing resistors as associated with respective ones of first nozzle openings and under a fluid path in an area between a first fluid feed slot edge and the first firing resistors, and do not disclose a fluid ejection device as claimed in independent claim 22 including, amongst other things, a reference conductor formed on a substrate and disposed between adjacent ones of first vaporization chambers as communicated with respective ones of first nozzle openings and under a fluid path in an area between the first vaporization chambers and a first fluid feed slot edge.

In addition, with respect to the Maze, Cleland, Meyer, and Chen references, Applicant submits that these references, individually or in combination, do not disclose a method as claimed in independent claim 43 including, amongst other things, receiving a first current from first firing resistors at a reference conductor formed on a substrate between adjacent ones of the first firing resistors as associated with respective ones of first nozzle openings and under a fluid path in an area between a first fluid feed slot edge and the first firing resistors, and conducting part of the first current through the reference conductor as disposed between the adjacent ones of the first firing resistors and between the first fluid feed slot edge and the first firing resistors, and do not disclose a fluid ejection device as claimed in independent claim 56 including, amongst other things, a reference conductor disposed between adjacent ones of firing resistors as communicated with respective ones of nozzle openings, between conductive leads of the adjacent ones of the firing resistors, and under a fluid path in an area between an edge of a fluid feed slot and vaporization chambers.

In view of the above, Applicant submits that independent claims 1, 22, 43, and 56, and the dependent claims depending therefrom, are each patentably distinct from the Maze, Cleland, Meyer, and Chen references and, therefore, are each in a condition for allowance. Applicant, therefore, respectfully requests that the rejections of claims 1, 4, 6-22, 24-31, 33,

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43, 44, 56, and 57 under 35 U.S.C. 103(a) be reconsidered and withdrawn, and that claims 1, 4, 6-22, 24-31, 33, 43, 44, 56, and 57 be allowed.

CONCLUSION

In view of the above, Applicant respectfully submits that pending claims 1, 4, 6-22, 24-31, 33, 43, 44, 56, and 57 are all in a condition for allowance and requests reconsideration of the application and allowance of all pending claims.

Any inquiry regarding this Amendment and Response should be directed to either Timothy F. Myers at Telephone No. (541) 715-4197, Facsimile No. (541) 715-8581 or Scott A. Lund at Telephone No. (612) 573-2006, Facsimile No. (612) 573-2005. In addition, all correspondence should continue to be directed to the following address:

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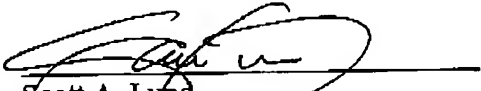
Respectfully submitted,

Joseph M. Torgerson et al.,

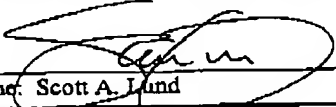
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By 
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